Trader Behavior vs Market Sentiment
Data Science Assignment – Web3 Trading Team
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📌 Objective

The goal of this assignment was to analyze how trader behavior — specifically **profitability, volume, and trade activity** — aligns or diverges from **market sentiment**, using two datasets:

1. Historical Trader Data from Hyperliquid
2. Bitcoin Fear & Greed Index

The task focused on uncovering **hidden trends and behavioral patterns** that could inform smarter trading strategies or risk management practice

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📈 Approach

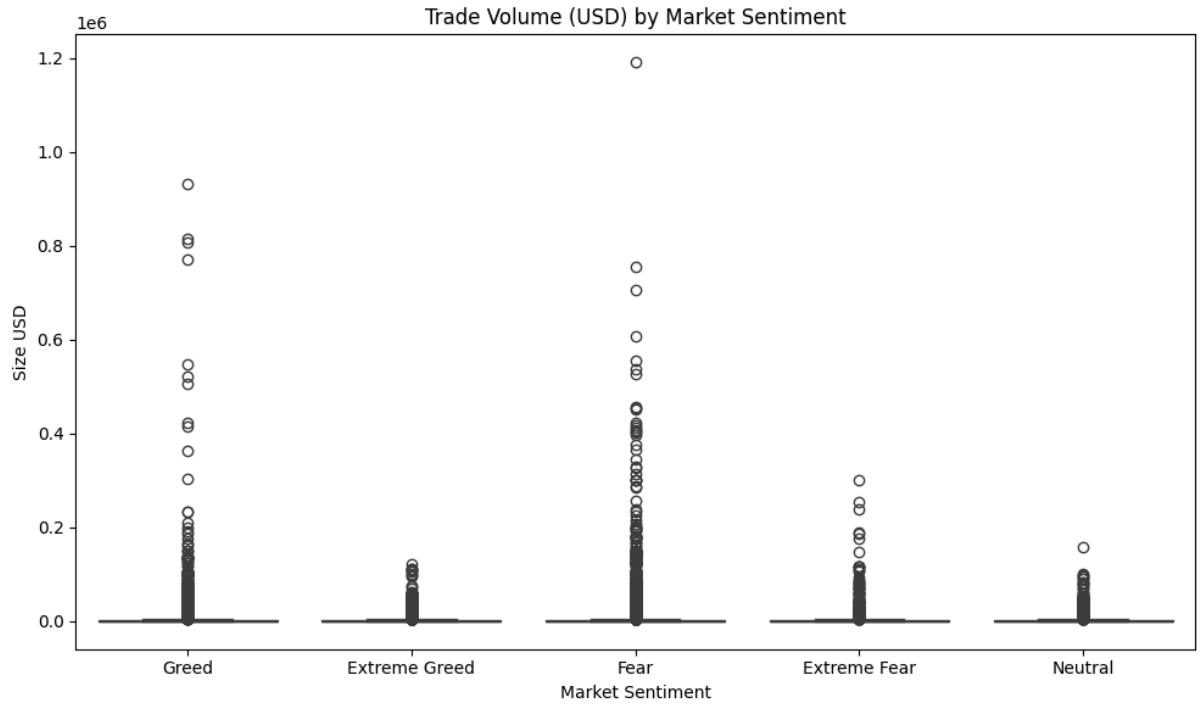
- Loaded and cleaned both datasets using Python (Pandas, Seaborn)
- Merged data using the date column to align each trade with the corresponding market sentiment
- Conducted visual exploratory data analysis (EDA) to compare:
    - **Profitability (Closed PnL)** by sentiment
    - **Trade Volume (Size USD)** by sentiment
    - **Trade Frequency** by sentiment
- Focused on the core goal: turning raw trade logs into **strategic behavioral signal**

🔍Key Insights

✅ 1. Trade Volume Spikes During Greed

> During "Greed" sentiment days, traders significantly increased trade volume (in USD), indicating increased confidence or aggressive positioning in the market.

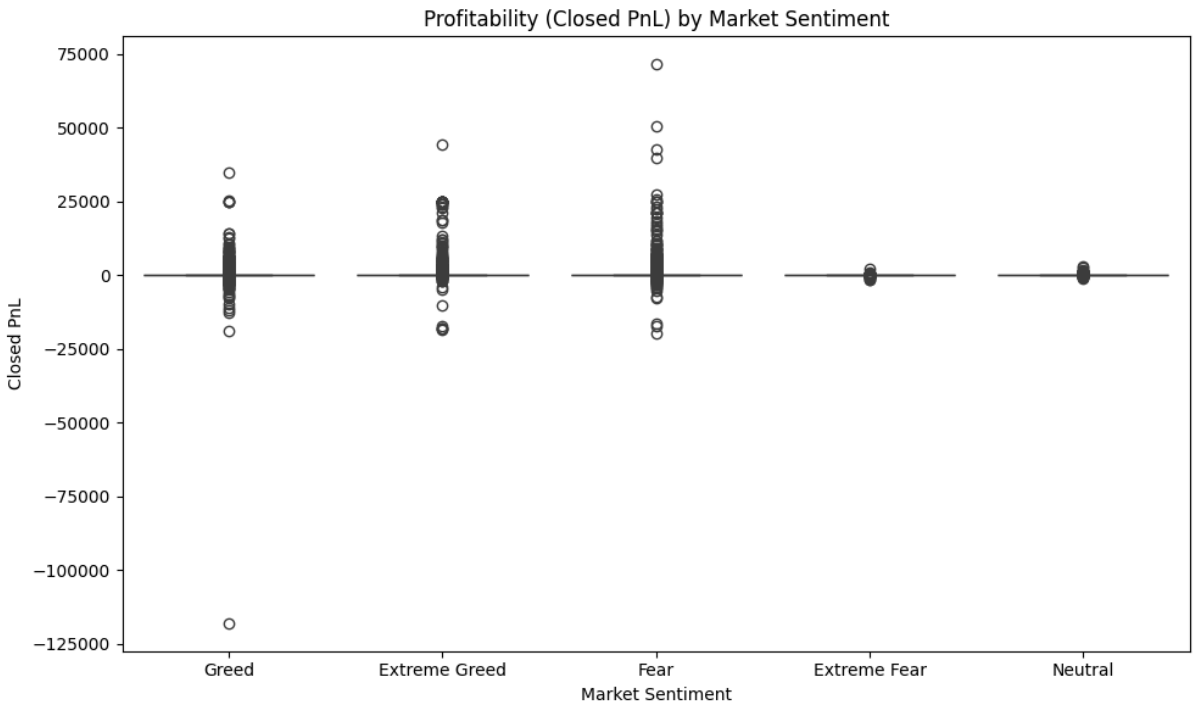
Interpretation:
This suggests traders are more willing to allocate larger amounts of capital when sentiment is bullish, possibly chasing gains.



✅ 2. Profitability Doesn’t Always Follow Greed

> Boxplot analysis of `closed_pnl` showed no consistent improvement in profitability during Greed phases.

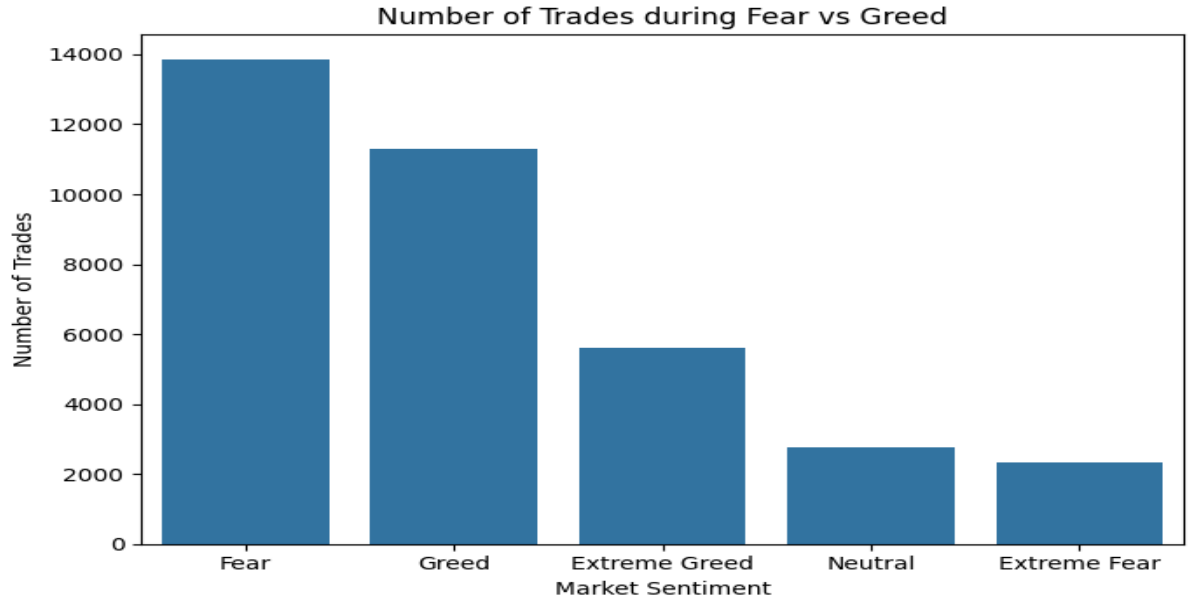
Interpretation:
This indicates that higher activity doesn't guarantee better results — possibly due to overconfidence, market tops, or late entries.



✅ 3. More Trades During Fear

> Surprisingly, the total number of trades was higher during Fear sentiment days.

Interpretation:
This could be due to panic-driven activity such as stop-loss triggers, rapid exits, or attempts to "buy the dip." It reflects short-term emotional trading, not necessarily strategic.



✅ 4. Behavioral Divergence is Real

> There is a clear behavioral divergence between what sentiment signals and what traders do. Greed leads to more aggressive volume, but not always higher PnL. Fear triggers more trades but often smaller size.

💡 Strategic Takeaways

- Traders and institutions could use this behavioral data to adjust risk models dynamically based on real-time sentiment.
- Platforms can use this as a trigger for alert systems (e.g., flag aggressive volume during Greed or increased panic trades during Fear).
- These patterns are repeatable signals, which can be built into predictive models for trade recommendation or market timing.

🛠️ Tools & Stack Used

- Python (Pandas, Seaborn, Matplotlib)
- Google Colab
- Data Cleaning, Feature Engineering, Visual Analysis

📁 Deliverables

- `notebook_1.ipynb`: Complete EDA and analysis logic
- `merged_trader_sentiment.csv`: Cleaned and merged dataset
- Visual charts showing sentiment-linked trends
- Structured GitHub project folder as per instructions

🏁 Conclusion

This analysis clearly shows that market sentiment significantly influences trader behavior — but not always in a rational way. By understanding how sentiment maps to actual trading behavior, we can help build smarter, safer, and more profitable trading systems.

I look forward to the opportunity to contribute these insights — and much more — as part of your Data Science team.